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Laboratory Item No. 250

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*South
Tower track
optical plotting
No 17054-1 } Jun 61*

A SUMMARY OF ENGINEERING PROPERTIES, SIZE AND COMPOSITION

ANALYSES OF SAMPLES FROM SOLOMONS ISLAND, MARYLAND

Engineering Properties:
Prepared by Newell Stiles
June, 1965

1 Sample

Size and Composition:
Prepared by Jess Coleman
June, 1965

Geological Laboratory Branch
Ocean Surveys Division
Oceanographic Surveys Dept.

M 109005016

EXPLANATION OF DATA PAGES
CORE ANALYSIS SUMMARY SHEET
Sediment Size and Composition
NAVOCEANO (EXP) 3167/18A (Rev. 1-63)

Results of, sediment-size and -composition, core analysis performed by the U. S. Naval Oceanographic Office Geological Laboratory are recorded on Core Analysis Summary Sheet Sediment Size and Composition.

The following is a description of the terms employed on the Core Analysis Summary Sheet:

1. Cruise Number. A number assigned to each cruise for identification purposes.
2. Latitude. Expressed in degrees, minutes, and seconds.
3. Longitude. Expressed in degrees, minutes, and seconds.
4. Sample Number. A consecutive number, commencing with 1, applied to each core taken successively throughout the cruise.
5. Date Taken. Day (GMT), month, and year.
6. Water Depth (m). The uncorrected sonic sounding recorded in meters.
7. Type Corer. Identified by name of device employed.
8. Core Length (cm). Recorded in centimeters as observed in the laboratory.
9. Core Penetration (cm). Recorded in centimeters as observed in the field.
10. Laboratory Number. A reference number assigned to a fraction of a sample retained by the laboratory.
11. Subsample Depth in Core (cm). Interval of subsample as measured in centimeters from the top of the core.
12. Color (GSA Rock Color Chart). Based on the Geological Society of America Rock-Color Chart. F or L indicates where color determination was made. For those samples where color was determined in the laboratory, the sample was moistened for a color determination.
13. Odor. A qualitative description of any noticeable odors.

14. Size and Composition Analysis.

a. through n. Sample fraction diameter size values are based on dry weight and are given in millimeters to the nearest whole percent. An American Instrument Company sieving machine and U. S. standard sieves were used for determining sand and larger fractions ($> .062\text{mm}$). The pipette method, based on Stokes' Law (for computing settling rates of spherical particles), was used to determine silt size ($.062$ to $.004\text{mm}$) and clay size particles ($< .004\text{mm}$).

o. Median Diameter (mm). Is the middle most member of the distribution curve above which 50 percent of the diameters in the distribution are larger and below which 50 percent of the diameters are smaller expressed in millimeters.

p. Sorting Coefficient. Is the square root of the ratio of the two quartiles, so chosen that the value is always greater than unity. (Trask 1932).

$$\text{Sorting Coefficient} = \sqrt{\frac{Q_{25}}{Q_{75}}}$$

q. Skewness. Is a measurement of the asymmetry of the curve in such a way that departure of the mean from the median is independent of the spread or deviation of the curve. Expressed in millimeters to the nearest hundredth with the given value computed from Trask's formula.

$$\text{Skewness} = \frac{Q_{25}Q_{75}}{\text{Median Diameter}^2}$$

r. Standard Deviation (mm). A measure, in millimeters, of the degree of spread or degree of dispersion of the data about the central tendency.

$$\text{Standard Deviation} = \sqrt{\sum_{i=1}^n (X_i - \bar{X})^2 / (n-1)}$$

s. Sediment Type. Determined by sand, silt, and clay ratios of the sample based on the F. P. Shepard sediment triangle (as modified) shown in Figure B-1.

t. and u. Dominant and Secondary Minerals (%). Percentage of fraction volume of the dominant and secondary minerals.

v. Calcium Carbonate (%). Percentage of total sample weight determined by EDTA method.

w. Organic Carbon (%). Percentage of total sample weight determined by Allison method.

15. Remarks.

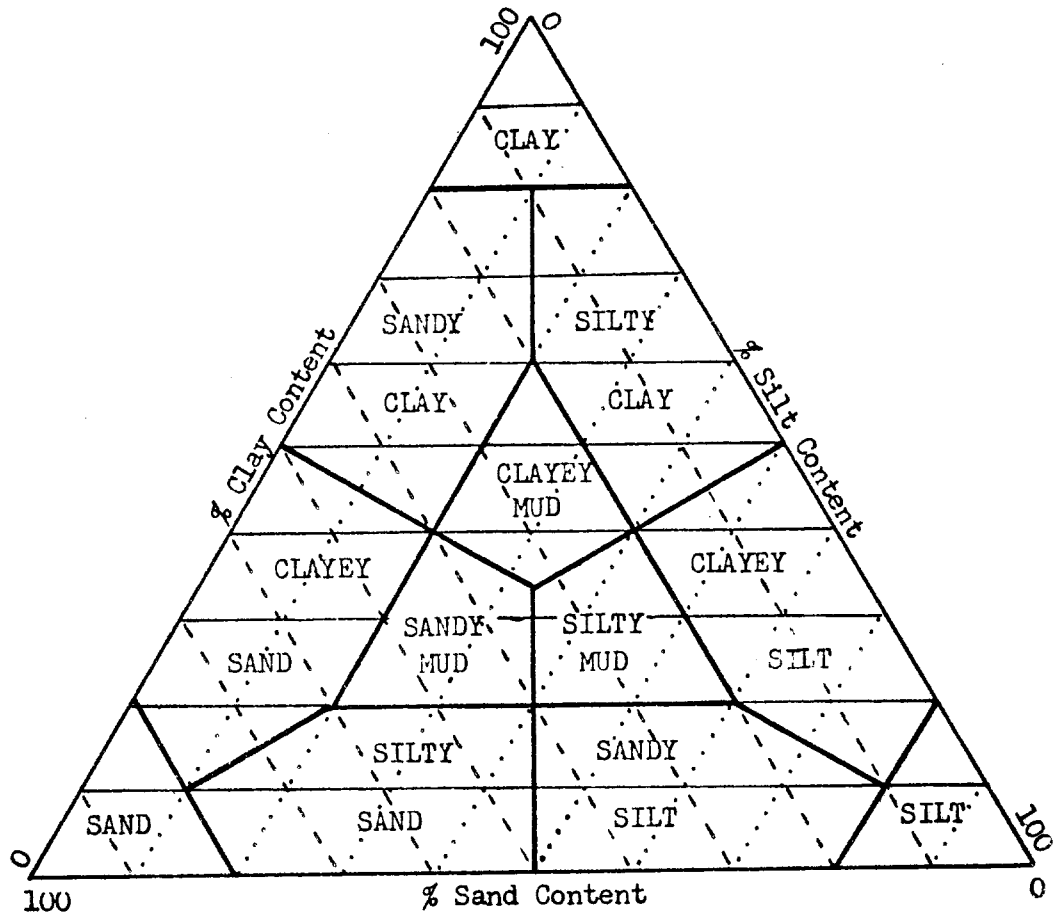


FIGURE B-1. MODIFIED NOMENCLATURE OF SEDIMENT TYPES
(after Shepard, 1954, p. 157)

EXPLANATION OF DATA PAGES
CORE ANALYSIS SUMMARY SHEET
Engineering Properties
NAVOCEANO (EXP) 3167/18B (Rev. 1-63)

Results of engineering properties, core analysis performed by the U. S. Naval Oceanographic Office Geological Laboratory are recorded on Core Analysis Summary Sheet Engineering Properties.

The following is a description of the terms employed on the Core Analysis Summary Sheet:

1. Cruise Number. A number assigned to each cruise for identification purposes.
2. Latitude. Expressed in degrees, minutes, and seconds.
3. Longitude. Expressed in degrees, minutes, and seconds.
4. Sample Number. A consecutive number, commencing with 1, applied to each core taken successively throughout the cruise.
5. Date Taken. Day (GMT), month, and year.
6. Water Depth (m). The uncorrected sonic sounding recorded in meters.
7. Type Corer. Identified by the name of device employed.
8. Core Length (cm). Recorded in centimeters as observed in the laboratory.
9. Core Penetration (cm). Recorded in centimeters as observed in the field.
10. Subsample Depth in Core (cm). Interval of subsample as measured in centimeters from the top of the core.
11. Wet Unit Weight (g/cm^3). The weight (solids plus water) per unit volume of the sediment mass.
12. Specific Gravity of Solids. The ratio of weight in air of a given volume of a sediment at 20°C to the weight in air of an equal volume of distilled water at 20°C .
13. Water Content (% dry weight). The ratio, in percent, of the weight of water in a given mass of the sediment sample to the weight of the solid particles.

14. Void Ratio. The ratio of the volume of void spaces to the volume of solid particles in the sediment sample as computed from Wet Unit Weight, Specific Gravity of Solids, and Water Content.

15. Saturated Void Ratio. The Void Ratio at 100 percent saturation as computed from Water Content and Specific Gravity of Solids.

$$\text{Saturated Void Ratio} = \frac{\text{Water Content} \times \text{Specific Gravity of Solids}}{100}$$

16. Porosity (%). The ratio, usually expressed as a percentage, of the volume of voids of a sediment mass to the total volume of the sediment mass.

17. Liquid Limit. Water Content, in percent, at which a pat of sediment cut by a groove of standard dimension will flow together for a distance of 1/2 inch under the impact of 25 blows in a standard liquid limit apparatus.

18. Plastic Limit. Water Content, in percent, at which a sediment will just begin to crumble when rolled into a thread approximately 1/8 inch in diameter.

19. Plasticity Index. The numerical difference between the Liquid Limit and Plastic Limit of the sediment mass.

20. Liquidity Index. The ratio, expressed in percentage, of (1) the natural water content of the sediment sample minus its Plastic Limit to (2) its Plasticity Index.

21. Compression Index. The slope of the linear portion of the Pressure-Void Ratio curve on a semi-log plot.

22. Compressive Strength. The load per unit area required to shear an unconfined, natural or remolded, sediment mass.

23. Cohesion. The shearing strength per unit area under zero externally applied load.

24. Sensitivity. The ratio of the natural to the remolded strength. It is a measure of the loss of strength due to remolding the sediment mass.

25. Angle of Internal Friction (°). The angle between the abscissa and the tangent of the curve representing the relationship of "shearing resistance" to "normal stress" acting within a sediment mass.

26. Activity. The ratio of the Plasticity Index to the clay fraction percentage (< .002 mm) of the sediment mass.

27. Modulus of Elasticity. The ratio of stress to strain of the sediment mass.

28. Slump (%). The ratio, in percent, of the amount of height change immediately before the compressive strength test to the original height of a cylinder of sediment.

CORE ANALYSIS SUMMARY SHEET

MC609005016

ANALYZED BY STIKES
DATE 29 JUNE '65

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CORE ANALYSIS SUMMARY SHEET
ENGINEERING PROPERTIES

PRNC-NAVOCEANO-3167/18 B (4-63)

ANALYZED BY STIKES
DATE 29 JUNE 65

MS 116-86

1. CRUISE NO. <u>250</u>	4. SAMPLE NO. <u>1</u>	7. TYPE CORER <u>GRAVITY - 200 #</u>
2. LATITUDE <u>38° 19' N</u>	5. DATE TAKEN (Day, month, year) <u>17 MAY 65</u>	8. CORE LENGTH (cm) <u>200.0</u>
3. LONGITUDE <u>076° 24' W</u>	6. WATER DEPTH (m) <u>24.2</u>	9. CORER PENETRATION (cm)
10. SUBSAMPLE DEPTH IN CORE (cm)	<u>120-130</u> <u>130-140</u> <u>140-150</u> <u>150-160</u> <u>160-170</u>	
11. WET UNIT WEIGHT (g/cm ³)	<u>1.68</u> <u>1.41</u> <u>1.54</u> <u>1.75</u> <u>1.82</u>	
12. SPECIFIC GRAVITY OF SOLIDS		
13. WATER CONTENT (% dry weight)	<u>67</u> <u>93</u> <u>69</u> <u>53</u> <u>39</u>	
14. VOID RATIO		
15. SATURATED VOID RATIO		
16. POROSITY (%)		
17. LIQUID LIMIT		
18. PLASTIC LIMIT		
19. PLASTICITY INDEX		
20. LIQUIDITY INDEX		
21. COMPRESSION INDEX FROM LL		
22. COMPRESSIVE STRENGTH (g/cm ²)	<u>56</u> <u>60</u> <u>74</u>	
NATURAL REMOLD (g/cm ²)		
23. COHESION (g/cm ²)	<u>28</u> <u>9</u> <u>30</u> <u>30</u> <u>37</u>	
NATURAL REMOLD (g/cm ²)	<u>4</u> <u>25</u>	
24. SENSITIVITY	<u>2</u> <u>1</u>	
25. ANGLE OF INTERNAL FRICTION (°)		
26. ACTIVITY		
27. MODULUS OF ELASTICITY		
28. SLUMP (%)		
29. REMARKS		

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CORE ANALYSIS SUMMARY SHEET

PRNC-NAVOCEANO-3167/18 A (4-63)

ANALYZED BY COLEMAN

DATE 20 JUNE 65

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15. REMARKS